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09/743,593	03/15/2001	Roric O'Neill	CE30513P	5728

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EXAMINER
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GOSHTASBI, JAMSHID

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 09/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/743,593

Applicant(s)

O'NEILL, RORIE

Examiner

Jamshid Goshtasbi-G.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03/15/2001.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1, 3-9 and 11-13 is/are rejected.  
7) ☐ Claim(s) 2, 10 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on 15 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date No. 5.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

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### **DETAILED ACTION**

1. Claims 1-13 are pending in the application.

### ***Specification***

2. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 9** recites the limitation "the receiver" in line 2. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections – 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 5, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh (US 5642384) in view of Awater et al. (US 5862182).

As to **Claim 1**, Ramesh discloses a trellis coded modulation scheme with low envelope variation for mobile radio where a transmitter includes (Fig. 2; col. 4, lines 23-32) means of (a mapper) generating information symbols (by encoding digital information into symbol selected from a constellation; col. 4, lines 56-59), an (1/3) encoder (col. 2, line 67) for encoding (the input binary data; col. 5, lines 66-67) information symbols into higher order (binary symbols to be encoded by the mapper into symbols from the signal constellation; col. 6, lines 22-24 and 33-36) channel symbols at substantially the same symbol rate (same number of symbols in the constellation), the

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encoding including selection between redundant symbol values (by using a signal constellation that has a number of extra symbols over the number of symbols intended to be transmitted within a constrained maximum phase angle transitions; col. 5, lines 21-29) to reduce power (envelope) variation, and where one channel symbol is generated for each information symbol (the encoded output bits of the encoder are assigned to a symbol of each constellation; col. 6, lines 21-24); further, an iterative search is performed for this assignment (col. 7, lines 16-19) such that the resultant coded scheme provides optimal bit error rate (BER) performance for the channel type (Abstract) and, reducing the transmitted power envelope variation of the transmitted signal (col. 6, lines 37-39) as well as providing for (forward) error correction (col. 6, lines 46-49); Ramesh, however, fails to teach either encoding in response to a "forward error correction scheme, or the transmission of channel symbols on individual subchannels; however, in disclosing an OFDM digital communication system, Awater et al. teaches the use of complementary codes, where M input phases directly related to input data may be encoded to N, e.g., eight, output phases associated with respective carrier signals, in which a phase shift is applied to a subchannel to achieve a low peak-to-average power (PAP) ratio (col. 1, lines 33-39); further, Awater et al., also, teaches that the use of the complementary codes is also applicable to forward error correction as well as PAP reduction coding in OFDM systems (col. 7, line 36-43); Awater et al., also, teaches that in a multicarrier communication system such as OFDM, groups of  $kN$  bits are typically transmitted simultaneously over N subchannels, with K bits per channel using some form of QAM modulation (by a well known in the art OFDM modulator

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generating a combined signal; col. 1, lines 35-38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Awater et al. into the method of Ramesh for producing the claimed invention because encoding information symbols to higher order channel symbols provides the redundancy in constellations [symbol values] needed for the low envelope variation method of Ramesh and the "forward" error correction of the transmitted data, and to use a suchannel transmitter for transmission of channel symbols on individual subchannels in a combined signal.

**Claim 5** inherits all the limitations of Claim 1; further, Ramesh discloses the encoder for which there are 8 possible symbols for being mapped to 8 symbols of a constellation (8PSK; col. 6, lines 36-38); further, Awater et al. teaches encoding group of twelve binary bits into four groups of 8PSK phases. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Awater et al. into the method of Ramesh for producing the claimed invention because encoding BPSK ( $M=2$ ) information symbols into 8PSK ( $N=8$ ) the redundancy needed in Ramesh's method for assigning "channel" symbols.

As to **Claim 13**, the claimed method or reducing power variations in a communication system recites features that correspond with subject matter mentioned above in the rejection of Claim 1 and are applicable hereto.

7. Claims 3, 4, 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh (US 5642384) in view of Awater et al. (US 5862182) as applied to Claim 1

above, and further in view of Awater et al. (US 6175551 B1).

**Claim 3** inherits all the limitations of Claim 1; further, Awater et al. (US 6175551 B1), in discloses a system and method to reduce the peak-to-average power (PAP) ratio of systems transmitting parallel channels, teaches that a disadvantage of peak cancellation is that symbols with a large PAP ratio suffer more degradation after peak cancellation has been applied and are more vulnerable to errors; thus, forward error correction coding is applied across several OFDM/OCDM symbols, to correct errors caused by symbols with a large degradation, by the surrounding symbols (col. 5, lines 53-59); and that forward error correction may be introduced at the coding stage (col. 3, lines 62-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Awater et al. (US 6175551 B1) into the method of Ramesh (in view of Awater et al. (US 5862182)) for producing the claimed invention because forward error correcting scheme operating on a plurality of subchannels corrects errors caused by symbols with a large degradation, by the surrounding symbols.

**Claim 4** inherits all the limitations of Claim 1; further, the claimed elements of forward error correcting scheme and a trellis coding scheme correspond with subject matter mentioned above in the rejection of claims 1 and 3 and are applicable hereto.

**Claim 6** inherits all the limitations of Claim 1; further, Awater et al. (US 6175551 B1) teaches reducing PAP problem by canceling (i.e., compensation) the large signal peaks (i.e., amplitude) through subtraction of an appropriate reference function (col. 2, lines 1-6), where the peak cancellation involves a peak power (or peak amplitude)

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detector, a comparator to see if the peak power exceeds some threshold, and a scaling of the peak and surrounding samples (col. 3, lines 49-52), implemented by the circuitry of a peak cancellation block (col. 4, lines 10-13); thus reducing the amplitude variations of the (combined) signal; further, the implementation includes (Fig. 6; col. 5, lines 23-36) a look-up table (i.e., means for generating compensation data) that provides references to a shift-and-scale-reference-signal unit, operating together with the peak cancellation circuitry on the information symbols ( i.e., as an encoder, having two inputs for receiving). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Awater et al. (US 6175551 B1) into the method of Ramesh (in view of Awater et al. (US 5862182)) for producing the claimed invention because it provides an alternative or an additional mechanism for reducing power variations.

**Claim 7** inherits the limitations of Claim 6; further, the claimed communication system recites features (memory unit with precalculated compensation data, i.e., a look-up table) that correspond with subject matter treated above in the rejection of Claim 6 and are applicable hereto.

**Claim 8** inherits the limitations of Claim 6; further, the claimed communication system recites features (determination of the compensation data for the current information symbol in response to the intersymbol interference to or from surrounding symbols) that correspond with subject matter treated above in the rejection of Claim 6 and are applicable hereto.

**Claim 11** inherits the limitations of Claim 1; further, the claimed communication system recites features (employing an OFDM subchannel communication scheme) that correspond with subject matter treated above in the rejection of claims 1 and 3, and are applicable hereto.

**Claim 11** inherits the limitations of Claim 1; further, the claimed communication system recites features (employing an CDMA subchannel communication scheme) that correspond with subject matter treated above in the rejection of claims 1 and 3, and are applicable hereto.

***Allowable Subject Matter***

8. Claims 2 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Claims 2 and 10** are dependent on Claim 1.

**Claim 9** is dependent on Claim 6.

9. Claim 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Conclusions***

10. The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. They all each aspects of various methods and systems for reducing power variations in multicarrier communication systems; Humphrey et al. [US 6130918] and May et al. [US 5835536] adjust/compensate the magnitude/amplitude of symbols; Bauml et al. [US 6125103], de Couasnon et al. [US 5329552]. Jones et al. [US 6128351] exploit the redundancy of symbols in a constellation and reassign symbols from the constellation to the information symbols.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jamshid Goshtasbi-G. whose telephone number is (571) 272-3012. The examiner can normally be reached on M-F 8:00/4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jamshid Goshtasbi-G.  
Examiner  
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PRIMARY EXAMINER 9/14/04